TUCSON SUPPLEMENTAL RETIREMENT SYSTEM BOARD OF TRUSTEES
Notice of Regular Meeting/Agenda

Pursuant to A.R.S. § 38-431.02, notice is hereby given to the members of the Tucson Supplemental Retirement System (TSRS) Board of Trustees and to the general public that the TSRS Board will hold the following meeting virtually (remotely) using Microsoft Teams on:

Thursday, September 24th, 2020 at 8:30 A.M.

MEETING NOTE: Due to the impacts of the COVID-19 pandemic, which have prompted declarations of a public health emergency at the local, state and federal levels, this meeting will be conducted using measures to protect public health. This meeting will be held remotely through technological means, as permitted under Arizona law. The meeting will not include any items that will involve time set aside for public comments. The meeting will be recorded and posted to City Boards, Committees, and Commissions website for public review.

IN-PERSON ATTENDANCE BY MEMBERS OF THE PUBLIC WILL BE PROHIBITED.

PLEASE BE AWARE THAT THESE MEASURES ARE IN PLACE TO LIMIT THE NEED FOR MEMBERS OF THE PUBLIC TO PARTICIPATE IN LARGE PUBLIC GATHERINGS, WHILE ENSURING THAT THE DISCUSSIONS, DELIBERATIONS AND ACTIONS OF THE TSRS BOARD ARE TRANSPARENT AND CONDUCTED OPENLY.

For those individuals new to Microsoft Teams, please download the application and be ready when the meeting starts using the following information:

Join Microsoft Teams Meeting

+1 213-293-2303 United States, Los Angeles (Toll)

Conference ID: 834 458 409#

Local numbers | Reset PIN | Learn more about Teams | Meeting options

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A) Call to Order

B) Consent Agenda
1. Approval of Regular Board meeting minutes from August 27, 2020 Note 1
2. Approval of September 2020 Ratification Report
3. Approval of Corrected August 2020 Ratification Report
4. August Budget to Actual Report
5. August Monthly Investment Performance Review Note 1

C) Administrative Discussions
1. Discussion of Garcia Pension Overpayment and Recoupment*
2. Approval of Vacation Leave Carryover Code Change Note 1
3. IPS Revisions

Note 1: These materials will be distributed by close of business on Tuesday, September 22, 2020

D) Investment Manager Report
1. Real Estate Industry Report – Callan LLC
2. JPMorgan Fund Performance Review – Shawn Parris – JPMorgan

E) For the Board's Consideration
1. Fed Forecasts Low Interest Rates for Years
2. Private Infrastructure Investors See Opportunity Amid COVID-19 Fallout
3. Public Pensions' New Inflation Dilemma

F) Future Agenda Items

G) Adjournment

Please Note: Legal Action may be taken on any agenda item

*****Pursuant to A.R.S. 38-431.03(A)(3) and (4): the board may hold an executive session for the purposes of obtaining legal advice from an attorney or attorneys for the Board or to consider its position and instruct its attorney(s) in pending or contemplated litigation. The board may also hold an executive session pursuant to A.R.S. 38-431.03(A)(1) for the discussion or consideration of matters specific to an identified public officer, appointee, or employee or pursuant to A.R.S. 38-431.03(A)(2) for purposes of discussion or consideration of records, information or testimony exempt by law from public inspection.

Note 1: These materials will be distributed by close of business on Tuesday, September 22, 2020

Ratification Report for TSRS Board of Trustees

Application Dates: 08/11/20 - 09/10/20 — **Report Date: September 2020**

Name of Applicant	Type	Retirement Date	Age	Credited Service	Estimated calc or Final calc*	Avg Final Monthly Pay	Option	Pension Amount
Shields, Katherine N	Normal Retirement	8/11/2020	66.37	5.00	Final	2,105.61	Single Life	210.74
Chayet, Nikki A	Normal Retirement	8/15/2020	68.97	19.54	Final	9,227.80	Single Life	4,056.19
Wood, Valerie A	Normal Retirement	8/16/2020	54.19	26.51	Estimate	4,795.86	J&S 50	2,648.35
McDonald, Kathleen	Deferred Retirement	8/21/2020	54.40	25.60	FINAL	5,056.98	Single Life	2,913.03
Metzinger, Michael	Normal Retirement	8/28/2020	62.34	28.49	Estimate	5,279.70	J&S 100	2,987.09
Nelson, Bonnie S	Normal Retirement	9/3/2020	70.01	27.26	Estimate	3,900.56	J&S 100	2,188.11
Hernandez, Grace	Normal Retirement	9/2/2020	61.96	19.14	Estimate	3,229.37	Single Life	1,390.61
Lozano, Santiago	Normal Retirement	9/4/2020	55.65	27.49	Estimate	5,494.64	J&S 50	3,255.09
Scheuch, David M	Deferred Retirement	9/8/2020	65.00	5.60	Final	$11,763.73	Single Life	1,317.54

* Calculation of average final monthly pay and pension amount is estimated based on all available data and becomes a final calculation after the applicant has received payment for all accrued leave balances.

Source Material: GRS/Payroll

Prepared By: __Dawn Davis 9/18/2020________________________

Reviewed By: __Pete Saxton 9-18-2020________________________

Ratification Report for TSRS Board of Trustees								
Application Dates: 07/11/20 - 08/10/20							Report Date: August 2020	
Name of Applicant	**Type**	**Retirement Date**	**Age**	**Credited Service**	**Estimated calc or Final calc***	**Avg Final Monthly Pay**	**Option**	**Pension Amount**
Camacho-Collins, Gloria	Normal Retirement	8/7/2020	65.00	31.67	Estimate	5,392.46	J&S 50	3,656.96

* Calculation of average final monthly pay and pension amount is estimated based on all available data and becomes a final calculation after the applicant has received payment for all accrued leave balances.

Source Material: GRS/Payroll

Prepared by: Dawn Davis 8/31/2020

Reviewed by: Pete Saxton 8-31-2020

Report ID : FIN-COT-BA-0001
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City of Tucson
Budget vs Actual Expenses
Through: August, 2021
For Fiscal Year 2021

Parameter Page

Parameters and Prompts

Fiscal Year	2021
Accounting Period	2
Fund	072
Department	*
Unit	*
Object Code	*

Report Description

The Expenses vs. Actual Report shows expenditures and encumbrances for the selected accounting period and for the selected fiscal year compared against the current expense budget and the unobligated budget balance. The report is sectioned by Department, Fund and Unit and summarized by Object.

Report ID : FIN-COT-BA-0001
Run Date : 09/18/2020
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City of Tucson
Budget vs Actual Expenses
Through: August, 2021
For Fiscal Year 2021

Department 900 - TUCSON SUPPL RETIREMENT SYSTEM
Fund 072 - TUCSON SUPP RETIREMENT SYSTEM
Unit 9001 - Normal Retiree Benefit

Object	Current Period Encumbrance	Current Period Expenditure	Current Total Obligations	YTD Encumbrance	YTD Expenditure	YTD Total Obligations	Current Budgeted Amount	Unobligated Budget Balance	Percent
105 - PAYROLL PENSION	0.00	5,845,256.68	5,845,256.68	0.00	11,675,685.02	11,675,685.02	73,000,000	61,324,314.98	84.01 %
Total for 100 - PAYROLL CHGS	**0.00**	**5,845,256.68**	**5,845,256.68**	**0.00**	**11,675,685.02**	**11,675,685.02**	**73,000,000**	**61,324,314.98**	**84.01 %**
Total for Unit 9001 - Normal Retiree Benefit	**0.00**	**5,845,256.68**	**5,845,256.68**	**0.00**	**11,675,685.02**	**11,675,685.02**	**73,000,000**	**61,324,314.98**	**84.01 %**

City of Tucson
Budget vs Actual Expenses
Through: August, 2021
For Fiscal Year 2021

Department 900 - TUCSON SUPPL RETIREMENT SYSTEM

Fund 072 - TUCSON SUPP RETIREMENT SYSTEM

Unit 9003 - Normal Retiree Beneficiary Benefit

Object	Current Period Encumbrance	Current Period Expenditure	Current Total Obligations	YTD Encumbrance	YTD Expenditure	YTD Total Obligations	Current Budgeted Amount	Unobligated Budget Balance	Percent
105 - PAYROLL PENSION	0.00	409,629.81	409,629.81	0.00	811,069.70	811,069.70	5,300,000	4,488,930.30	84.70 %
Total for 100 - PAYROLL CHGS	**0.00**	**409,629.81**	**409,629.81**	**0.00**	**811,069.70**	**811,069.70**	**5,300,000**	**4,488,930.30**	**84.70 %**
Total for Unit 9003 - Normal Retiree Beneficiary Benefit	**0.00**	**409,629.81**	**409,629.81**	**0.00**	**811,069.70**	**811,069.70**	**5,300,000**	**4,488,930.30**	**84.70 %**

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City of Tucson
Budget vs Actual Expenses
Through: August, 2021
For Fiscal Year 2021

Department 900 - TUCSON SUPPL RETIREMENT SYSTEM
Fund 072 - TUCSON SUPP RETIREMENT SYSTEM
Unit 9020 - Disability Retiree Benefit

Object	Current Period Encumbrance	Current Period Expenditure	Current Total Obligations	YTD Encumbrance	YTD Expenditure	YTD Total Obligations	Current Budgeted Amount	Unobligated Budget Balance	Percent
105 - PAYROLL PENSION	0.00	159,029.81	159,029.81	0.00	318,059.62	318,059.62	2,000,000	1,681,940.38	84.10 %
Total for 100 - PAYROLL CHGS	**0.00**	**159,029.81**	**159,029.81**	**0.00**	**318,059.62**	**318,059.62**	**2,000,000**	**1,681,940.38**	**84.10 %**
Total for Unit 9020 - Disability Retiree Benefit	**0.00**	**159,029.81**	**159,029.81**	**0.00**	**318,059.62**	**318,059.62**	**2,000,000**	**1,681,940.38**	**84.10 %**

City of Tucson
Budget vs Actual Expenses
Through: August, 2021
For Fiscal Year 2021

Department 900 - TUCSON SUPPL RETIREMENT SYSTEM
Fund 072 - TUCSON SUPP RETIREMENT SYSTEM
Unit 9021 - Pension Fund Administration

Object	Current Period Encumbrance	Current Period Expenditure	Current Total Obligations	YTD Encumbrance	YTD Expenditure	YTD Total Obligations	Current Budgeted Amount	Unobligated Budget Balance	Percent
101 - SALARIES & WAGES FOR PERMANENT EMPLOYEES	0.00	34,971.39	34,971.39	0.00	49,352.34	49,352.34	336,457	287,104.73	85.33 %
108 - DOWNTOWN ALLOWANCE & DISCOUNTED TRANSIT PASSES	0.00	121.17	121.17	0.00	163.21	163.21	1,350	1,186.79	87.91 %
113 - TSRS PENSION CONTRIBUTION	0.00	9,617.13	9,617.13	0.00	13,975.45	13,975.45	92,528	78,552.24	84.90 %
114 - FICA (SOCIAL SECURITY)	0.00	2,547.91	2,547.91	0.00	3,699.09	3,699.09	25,846	22,147.00	85.69 %
115 - WORKERS COMPENSATION INSURANCE	0.00	398.32	398.32	0.00	546.15	546.15	3,628	3,081.91	84.95 %
116 - GROUP PLAN INSURANCE	0.00	4,853.54	4,853.54	0.00	7,419.79	7,419.79	0	(7,419.79)	0.00%
130 - MEDICAL	0.00	0.00	0.00	0.00	0.00	0.00	40,775	40,774.87	100.00 %
131 - DENTAL	0.00	0.00	0.00	0.00	0.00	0.00	1,694	1,693.67	100.00 %
132 - LIFE INSURANCE	0.00	0.00	0.00	0.00	0.00	0.00	150	150.00	100.00 %
133 - LONG TERM DISABILITY	0.00	0.00	0.00	0.00	0.00	0.00	99	99.33	100.00 %
134 - EMPLOYEE ASSISTANCE PROGRAM	0.00	0.00	0.00	0.00	0.00	0.00	65	65.33	100.00 %
196 - INTERDEPARTMENTAL LABOR	0.00	0.00	0.00	0.00	0.00	0.00	96,000	96,000.00	100.00 %
Total for 100 - PAYROLL CHGS	**0.00**	**52,509.46**	**52,509.46**	**0.00**	**75,156.03**	**75,156.03**	**598,592**	**523,436.08**	**87.44 %**
202 - TRAVEL	0.00	0.00	0.00	0.00	0.00	0.00	18,000	18,000.00	100.00 %
204 - TRAINING	0.00	0.00	0.00	0.00	360.00	360.00	14,000	13,640.00	97.43 %
205 - PARKING SERVICE	0.00	0.00	0.00	0.00	0.00	0.00	500	500.00	100.00 %
207 - EXECUTIVE VEHICLE ALLOWANCE	0.00	198.00	198.00	0.00	264.00	264.00	1,733	1,469.33	84.77 %
212 - CONSULTANTS AND SURVEYS	0.00	0.00	0.00	0.00	52,530.00	52,530.00	436,000	383,470.00	87.95 %

City of Tucson
Budget vs Actual Expenses
Through: August, 2021
For Fiscal Year 2021

Department 900 - TUCSON SUPPL RETIREMENT SYSTEM
Fund 072 - TUCSON SUPP RETIREMENT SYSTEM
Unit 9021 - Pension Fund Administration

Object	Current Period Encumbrance	Current Period Expenditure	Current Total Obligations	YTD Encumbrance	YTD Expenditure	YTD Total Obligations	Current Budgeted Amount	Unobligated Budget Balance	Percent
213 - LEGAL	0.00	0.00	0.00	0.00	8,936.50	8,936.50	50,000	41,063.50	82.13 %
215 - AUDITING AND BANK SERVICES	0.00	0.00	0.00	0.00	0.00	0.00	380,000	380,000.00	100.00 %
219 - MISCELLANEOUS PROFESSIONAL SERVICES	0.00	10.00	10.00	0.00	30.00	30.00	784,000	783,970.00	100.00 %
221 - INSUR-PUBLIC LIABILITY	0.00	556.47	556.47	0.00	757.46	757.46	6,761	6,003.28	88.80 %
228 - HAZARDOUS WASTE INSURANCE	0.00	33.00	33.00	0.00	44.99	44.99	411	365.65	89.04 %
232 - R&M MACHINERY & EQUIPMENT	0.00	0.00	0.00	0.00	0.00	0.00	1,200	1,200.00	100.00 %
245 - TELEPHONE	0.00	0.00	0.00	0.00	0.00	0.00	1,200	1,200.00	100.00 %
260 - COMPUTER SOFTWARE MAINTENANCE AGREEMENTS	0.00	0.00	0.00	681.26	0.00	681.26	151,000	150,318.74	99.55 %
263 - PUBLIC RELATIONS	0.00	0.00	0.00	0.00	0.00	0.00	2,560	2,560.00	100.00 %
264 - INVESTMENT MGT FEES & COMMISSIONS	0.00	85,761.79	85,761.79	0.00	425,468.58	425,468.58	3,750,000	3,324,531.42	88.65 %
265 - SECURITIES LENDING (STOCK FEES)	0.00	0.00	0.00	0.00	0.00	0.00	60,000	60,000.00	100.00 %
277 - CARRIED INTEREST EXPENSE	0.00	0.00	0.00	0.00	0.00	0.00	4,500,000	4,500,000.00	100.00 %
284 - MEMBERSHIPS AND SUBSCRIPTIONS	0.00	0.00	0.00	0.00	0.00	0.00	1,500	1,500.00	100.00 %
Total for 200 - PROF CHARGES	**0.00**	**86,559.26**	**86,559.26**	**681.26**	**488,391.53**	**489,072.79**	**10,158,865**	**9,669,791.92**	**95.19 %**
311 - OFFICE SUPPLIES	0.00	0.00	0.00	0.00	0.00	0.00	5,500	5,500.00	100.00 %
312 - PRINTING,PHOTOGRAPHY,REPRODUCTION	0.00	1,191.99	1,191.99	0.00	2,650.88	2,650.88	9,000	6,349.12	70.55 %
314 - POSTAGE	0.00	27.23	27.23	0.00	42.38	42.38	12,000	11,957.62	99.65 %
317 - COMPUTER SOFTWARE < $100,000	0.00	0.00	0.00	0.00	60.92	60.92	500	439.08	87.82 %
341 - BOOK, PERIODICALS AND RECORDS	0.00	0.00	0.00	0.00	0.00	0.00	250	250.00	100.00 %

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City of Tucson
Budget vs Actual Expenses
Through: August, 2021
For Fiscal Year 2021

Department 900 - TUCSON SUPPL RETIREMENT SYSTEM
Fund 072 - TUCSON SUPP RETIREMENT SYSTEM
Unit 9021 - Pension Fund Administration

Object	Current Period Encumbrance	Current Period Expenditure	Current Total Obligations	YTD Encumbrance	YTD Expenditure	YTD Total Obligations	Current Budgeted Amount	Unobligated Budget Balance	Percent
345 - FURNISHINGS, EQUIPMENT AND TOOLS < $5,000	0.00	0.00	0.00	0.00	0.00	0.00	1,000	1,000.00	100.00 %
346 - COMPUTER EQUIPMENT < $5,000	0.00	0.00	0.00	0.00	0.00	0.00	1,000	1,000.00	100.00 %
359 - NON OFFICE SUPPLIES	0.00	0.00	0.00	0.00	0.00	0.00	3,000	3,000.00	100.00 %
Total for 300 - SUPPLIES	**0.00**	**1,219.22**	**1,219.22**	**0.00**	**2,754.18**	**2,754.18**	**32,250**	**29,495.82**	**91.46 %**
Total for Unit 9021 - Pension Fund Administration	**0.00**	**140,287.94**	**140,287.94**	**681.26**	**566,301.74**	**566,983.00**	**10,789,707**	**10,222,723.82**	**94.75 %**

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City of Tucson
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Through: August, 2021
For Fiscal Year 2021

Department 900 - TUCSON SUPPL RETIREMENT SYSTEM
Fund 072 - TUCSON SUPP RETIREMENT SYSTEM
Unit 9022 - Disability Retiree Beneficiary Benefit

Object	Current Period Encumbrance	Current Period Expenditure	Current Total Obligations	YTD Encumbrance	YTD Expenditure	YTD Total Obligations	Current Budgeted Amount	Unobligated Budget Balance	Percent
105 - PAYROLL PENSION	0.00	34,565.12	34,565.12	0.00	70,206.92	70,206.92	490,000	419,793.08	85.67 %
Total for 100 - PAYROLL CHGS	**0.00**	**34,565.12**	**34,565.12**	**0.00**	**70,206.92**	**70,206.92**	**490,000**	**419,793.08**	**85.67 %**
Total for Unit 9022 - Disability Retiree Beneficiary Bene	**0.00**	**34,565.12**	**34,565.12**	**0.00**	**70,206.92**	**70,206.92**	**490,000**	**419,793.08**	**85.67 %**

City of Tucson
Budget vs Actual Expenses
Through: August, 2021
For Fiscal Year 2021

Department 900 - TUCSON SUPPL RETIREMENT SYSTEM
Fund 072 - TUCSON SUPP RETIREMENT SYSTEM
Unit 9023 - ACTIVE MEMBER REFUNDS-CONTRBS

Object	Current Period Encumbrance	Current Period Expenditure	Current Total Obligations	YTD Encumbrance	YTD Expenditure	YTD Total Obligations	Current Budgeted Amount	Unobligated Budget Balance	Percent
105 - PAYROLL PENSION	0.00	1,762.94	1,762.94	0.00	1,762.94	1,762.94	0	(1,762.94)	0.00%
186 - TSRS REFUNDS	0.00	159,381.53	159,381.53	0.00	225,014.24	225,014.24	2,791,000	2,565,985.76	91.94 %
Total for 100 - PAYROLL CHGS	**0.00**	**161,144.47**	**161,144.47**	**0.00**	**226,777.18**	**226,777.18**	**2,791,000**	**2,564,222.82**	**91.87 %**
Total for Unit 9023 - ACTIVE MEMBER REFUNDS-CON	**0.00**	**161,144.47**	**161,144.47**	**0.00**	**226,777.18**	**226,777.18**	**2,791,000**	**2,564,222.82**	**91.87 %**

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City of Tucson
Budget vs Actual Expenses
Through: August, 2021
For Fiscal Year 2021

Department 900 - TUCSON SUPPL RETIREMENT SYSTEM
Fund 072 - TUCSON SUPP RETIREMENT SYSTEM
Unit 9025 - INTEREST ON REFUNDS

Object	Current Period Encumbrance	Current Period Expenditure	Current Total Obligations	YTD Encumbrance	YTD Expenditure	YTD Total Obligations	Current Budgeted Amount	Unobligated Budget Balance	Percent
186 - TSRS REFUNDS	0.00	761.36	761.36	0.00	761.36	761.36	50,000	49,238.64	98.48 %
Total for 100 - PAYROLL CHGS	**0.00**	**761.36**	**761.36**	**0.00**	**761.36**	**761.36**	**50,000**	**49,238.64**	**98.48 %**
Total for Unit 9025 - INTEREST ON REFUNDS	**0.00**	**761.36**	**761.36**	**0.00**	**761.36**	**761.36**	**50,000**	**49,238.64**	**98.48 %**

City of Tucson
Budget vs Actual Expenses
Through: August, 2021
For Fiscal Year 2021

Department 900 - TUCSON SUPPL RETIREMENT SYSTEM

Fund 072 - TUCSON SUPP RETIREMENT SYSTEM

Unit 9026 - DWE SYSTEM BENEFIT PAYMENT

Object	Current Period Encumbrance	Current Period Expenditure	Current Total Obligations	YTD Encumbrance	YTD Expenditure	YTD Total Obligations	Current Budgeted Amount	Unobligated Budget Balance	Percent
186 - TSRS REFUNDS	0.00	44,288.91	44,288.91	0.00	44,288.91	44,288.91	200,000	155,711.09	77.86 %
Total for 100 - PAYROLL CHGS	**0.00**	**44,288.91**	**44,288.91**	**0.00**	**44,288.91**	**44,288.91**	**200,000**	**155,711.09**	**77.86 %**
Total for Unit 9026 - DWE SYSTEM BENEFIT PAYMENT	**0.00**	**44,288.91**	**44,288.91**	**0.00**	**44,288.91**	**44,288.91**	**200,000**	**155,711.09**	**77.86 %**

City of Tucson
Budget vs Actual Expenses
Through: August, 2021
For Fiscal Year 2021

Department 900 - TUCSON SUPPL RETIREMENT SYSTEM
Fund 072 - TUCSON SUPP RETIREMENT SYSTEM
Unit 9027 - CREDITABLE SERVICE TRANS(ASRS)

Object	Current Period Encumbrance	Current Period Expenditure	Current Total Obligations	YTD Encumbrance	YTD Expenditure	YTD Total Obligations	Current Budgeted Amount	Unobligated Budget Balance	Percent
186 - TSRS REFUNDS	0.00	0.00	0.00	0.00	0.00	0.00	80,000	80,000.00	100.00 %
Total for 100 - PAYROLL CHGS	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**80,000**	**80,000.00**	**100.00 %**
Total for Unit 9027 - CREDITABLE SERVICE TRANS(AS	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**80,000**	**80,000.00**	**100.00 %**

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Through: August, 2021
For Fiscal Year 2021

Department 900 - TUCSON SUPPL RETIREMENT SYSTEM
Fund 072 - TUCSON SUPP RETIREMENT SYSTEM
Unit 9028 - EXCESS SER TRS/CTY CONT(ASRS)

Object	Current Period Encumbrance	Current Period Expenditure	Current Total Obligations	YTD Encumbrance	YTD Expenditure	YTD Total Obligations	Current Budgeted Amount	Unobligated Budget Balance	Percent
186 - TSRS REFUNDS	0.00	0.00	0.00	0.00	0.00	0.00	1,000	1,000.00	100.00 %
Total for 100 - PAYROLL CHGS	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**1,000**	**1,000.00**	**100.00 %**
Total for Unit 9028 - EXCESS SER TRS/CTY CONT(ASR	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**1,000**	**1,000.00**	**100.00 %**
Total for Fund 072 - TUCSON SUPP RETIREMENT SYS	**0.00**	**6,794,964.10**	**6,794,964.10**	**681.26**	**13,713,150.45**	**13,713,831.71**	**94,701,707**	**80,987,875.11**	**85.52 %**
Total for Department 900 - TUCSON SUPPL RETIREME	**0.00**	**6,794,964.10**	**6,794,964.10**	**681.26**	**13,713,150.45**	**13,713,831.71**	**94,701,707**	**80,987,875.11**	**85.52 %**
Grand Totals	**0.00**	**6,794,964.10**	**6,794,964.10**	**681.26**	**13,713,150.45**	**13,713,831.71**	**94,701,707**	**80,987,875.11**	**85.52 %**

MEMORANDUM

DATE: September 18, 2020

TO: The Board of Trustees
Tucson Supplemental Retirement System

FROM: Art Cuaron
Pension & Benefits Administrator

SUBJECT: **System Overpayment**

This item is for information purposes only and will be discussed in detail in executive session. Board action is not required.

TSRS was notified in May 2020 of a pension benefit overpayment that occurred over a period of four years and totaled approximately $80,000, excluding interest. The member passed away in February of 2016 and the System was not notified of her death. We believe that a relative of the deceased member collected the pension payments until his death in February/March of this year. Payments continued until April 2020 when TSRS was notified by the personal representative of both the member and the relative. In executive session, we will provide additional information on the overpayment and our ongoing efforts to collect the overpayment.

It is important to note that TSRS does prescribe to a death audit service, but they did not pick up the notice of death of the member. The System relies heavily on this service, as well as, notification by next of kin, as a measure to cease payments to deceased members. Death overpayments are not a frequent occurrence in our operations. This situation demonstrates the difficulties the System faces where there is a deliberate attempt to conceal a member death.

To mitigate further overpayments, I am going to look into hiring an additional death audit service to perform a secondary review of all System deaths. I should note that should we move to BNY Mellon for retiree payroll processing, this service is provided on a quarterly basis at no charge to their clients.

MEMORANDUM

DATE: September 18, 2020

TO: The Board of Trustees
Tucson Supplemental Retirement System

FROM: Art Cuaron
Pension & Benefits Administrator

SUBJECT: **Investment Policy Statement Revision**

Board action is not required on this item and is for information and discussion only.

Attached is a draft of the re-write of the Investment Policy Statement, with the comments and edits put forth by the Board at last months' meeting, for the Board's review and consideration.

The Board does not need to take action to adopt this during the September meeting, however, should the Board feel the revisions accurately capture the intent of the document, action can be taken to adopt.

Attachment: Investment Policy Statement Revised 091820

Statement of Pension Investment Policy and Objectives

Tucson Supplemental Retirement System

Updated September 2020

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Table of Contents

Background, Purpose and Objectives

The purpose of this Investment Policy Statement (the "IPS" or the "Policy") is to assist the Board of Trustees (the "Board") in effectively establishing, monitoring, evaluating, and revising the investment program established for the Tucson Supplemental Retirement System ("TSRS"), a governmental, ERISA-exempt defined benefit plan sponsored by the city of Tucson.

TSRS was established and is maintained to provide retirement benefits to city employees. The Board is comprised of one Mayor Appointee, Finance Director, Human Resources Director, one City Manager Appointee, two elected employee representatives and one retiree representative. The Board works closely with the TSRS System Administrator and TSRS Staff, who all are City employees.

TSRS is operated in accordance with the Internal Revenue Code, the Arizona Revised Statutes and the Tucson City Code. This document provides a framework for the management of the assets of TSRS, which are referred to in this document as the "Fund." The Board establishes this investment policy in accordance with applicable local, state, and federal laws.

This IPS may be modified by action of the Board. The Policy identifies a set of investment objectives, guidelines, and performance standards for Fund investmentss. This Policy represents the formal document governing Fund investments and will be used as the basis for future investment performance measurement and evaluation. Neither the Board's general legal authority nor this Policy impacts the deposit of contributions to the Fund by the City of Tucson.

Investments will be made for the exclusive benefit of the participants and beneficiaries of TSRS and in accordance with the following objectives:

- To meet current and future obligations of TSRS when due.
- To invest the Fund with the care, skill, and diligence that a prudent person acting in a like capacity would exercise.
- To invest the Fund in a diversified manner that manages the overall risk and volatility of the Fund.
- To manage and monitor the costs of investing the Fund.
- To earn a rate of return, net of investment management fees, equal to or exceeding the expected rate of return (the actuarial rate). The Fund will be managed in perpetuity indicating a long time horizon in which to evaluate investments.

[ALTERNATIVE LANGUAGE ON "OBJECTIVES" FOR BOARD CONSIDERATION (from other Callan clients):

- *Solely in the interest of, and for the exclusive purpose of, providing benefits to participants and their beneficiaries, minimizing contributions to TSRS, and defraying reasonable expenses of administering TSRS.*
- *Invest and manage the Fund as a prudent investor would, by considering the purposes, terms, distribution requirements, and other circumstances of the Fund. In satisfying this standard of care, the Board shall exercise reasonable care, skill, and caution.*

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<#>Funding???¶

- *Diversify the investments of the Fund so as to minimize the risk of loss and to maximize the rate of return, unless under the circumstances it is clearly prudent not to do so. Diversification is applicable to the deployment of the assets as a whole.]*

Roles and Responsibilities

Board

The Board is generally responsible for developing, implementing, supervising and evaluating the investment policy of TSRS, hiring investment managers, custodians, consultants and transition managers (referred to as "Service Providers") and monitoring and evaluating the effectiveness of the Service Providers in carrying out their respective duties.

The Board's specific investment related responsibilities, which shall be carried out with professional advice and assistance from the Board's Investment Consultant and administrative support from the TSRS Staff, include:

- Establishing the investment policy for the Fund, including:

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  - Asset allocation policy, which establishes and communicates the Board's return expectations and risk tolerance;
  - Investment manager structure policy, which establishes and communicates the Board's decisions regarding the number and types of investment managers that are appropriate for the Fund and

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  - Investment manager guidelines, which establish and communicate the risk parameters set by the Board for each individual manager consistent with the overall risk level set for the Fund. The Board is able to establish investment guidelines for separately managed accounts and must accept guidelines for pooled vehicles such as collective investment trusts and mutual funds.

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- Hiring a Custodian and an Investment Consultant to assist the Board and the TSRS Staff in implementing investment policy and managing the Fund.

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- Appointing investment managers to fulfill specific roles defined by the Fund's asset allocation.

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- Establishing effective communication and review procedures between the investment managers, the Investment Consultant, the Custodian and the Board.
- Monitoring and evaluating each investment manager's success in achieving the objectives set for such manager by the Board and adhering to established guidelines.
- Approving the termination and, if appropriate, replacement of an investment manager when necessary.
- Monitoring and controlling Fund investment expenses.

  Deleted: , including investment manager fees, trustee and Custodian fees, and trading costs

- Establishing a rebalancing policy and procedures.

Investment Managers

The specific duties and responsibilities of each of the fund's investment managers are to manage the assets under their supervision in accordance with the guidelines and objectives outlined in their respective prospectuses, participation agreements, investment management agreements or other governing documents.

Managers should be responsive to the Board Staff, and/or Investment Consultant and provide information as necessary.

Investment Consultant

The primary role of the Investment Consultant is to assist the Board and Staff in fulfilling their responsibilities by providing information, analysis, and recommendations that support a prudent process. The responsibilities of the Investment Consultants are as follows:

- Provide perspectives on capital markets;
- Assist the Board in the development, implementation and evaluation of investment policy and objectives;
- Research and recommend structure and investments that are appropriate in furthering TSRS' investment policies and objectives;
- Recommend appropriate performance measures and benchmarks and report on the effectiveness of those adopted;
- Monitor the investment management firms and products employed by TSRS on an on-going basis and inform the Board of any developments that might impact Fund performance or TSRS;
- Measure, evaluate, and report investment managers' performance results on a quarterly basis. Such reports will evaluate the performance and risk characteristics of each investment strategy relative to targets established in this Investment Policy Statement. The Investment Consultant will also evaluate the investment style of each manager to determine if the manager is fulfilling the role for which they were hired;
- Conduct a prudent investment manager search process, as needed, to identify appropriate candidates for review and selection by the Board; and
- Report quarterly to the Board.

Custodian

The responsibilities of the trustee/custodian include:

- Safekeeping of Assets – custody, valuation and accounting & reporting of the Fund;
- Trade Processing – track and reconcile assets that are acquired and disposed; and,
- Asset Servicing – maintain all economic benefits of ownership such as income collection, corporate actions, and proxy notification issues.

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Policies and Procedures

Asset Allocation Guidelines

The asset allocation policy established by the Board is intended to reflect, and be consistent with, the Board's return objectives and risk tolerance. The asset allocation policy is designed to meet the investment objectives of TSRS.

Deleted: provide the greatest probability of meeting or exceeding TSRS's objectives at the lowest possible risk…

The Board selected the following asset allocation policy as a result of an asset liability study that examined the interaction of expected return and risk with liabilities determined by the actuary.

Percent of Total Pension Fund (As of , 2019)

Asset Class	Minimum	Target	Maximum
Equities:	**53%**	**58%**	**63%**
U.S. Large Capitalization	*22%*	*27%*	*32%*
U.S Small/Mid Capitalization	*4%*	*7%*	*10%*
International	*19%*	*24%*	*29%*
Fixed Income	**21%**	**25%**	**29%**
Real Estate	**9%**	**12%**	**15%**
Infrastructure	**3%**	**5%**	**7%**
Total		**100%**	

The Board will review the asset allocation targets annually, for reasonableness in relation to significant economic and market changes or to changes in the TSRS' long-term goals and objectives. A formal asset liability study will be conducted periodically to verify or provide a basis for revising the targets.

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Investment Manager Structure

The Board has developed an investment manager structure that emphasizes efficiency and cost control. The Board has employed the number of managers believed to provide appropriate diversification within each asset class and across the Fund's portfolio. The table below lists the roles to which individual investment managers are assigned, the target allocation of assets for each manager and the rebalancing ranges.

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Investment Manager Structure Allocations

Portfolio Style	Investment Manager	Minimum	Target	Maximum
U.S. Equity:				
Large Cap Equity (Index)	AB	6.3%	8.3%	10.3%
Large Cap Equity (Enhanced Index)	PIMCO	2.2%	4.2%	6.2%
Large Cap Growth Equity (Active)	T. Rowe Price	5.3%	7.3%	9.3%
Large Cap Value Equity (Index)	BlackRock	5.3%	7.3%	9.3%
Mid Cap Equity (Active)	Champlain Investment Partners	1.5%	3.5%	5.5%
Small Cap Equity (Active)	Fidelity Institutional Asset Management	1.5%	3.5%	5.5%
International Equity:				
Core Style (Active)	Aberdeen Asset Management	7.6%	9.6%	11.6%
Value Style (Active)	Causeway Capital Management	7.6%	9.6%	11.6%
Small Cap (Active)	American Century Investment Management	2.8%	4.8%	6.8%
U.S. Fixed Income:				
U.S. Investment Grade Fixed Income (Index)	BlackRock	10.5%	12.5%	14.5%
Non-Government Fixed Income (Active)	PIMCO	9.5%	12.5%	15.5%
Real Estate:				
Open-end Core Properties Fund	J.P. Morgan Asset Management	6.0%	8.0%	10.0%
Open-end Value Added Real Estate	J.P. Morgan Asset Management	2.0%	4.0%	6.0%
Infrastructure:				
Open Ended Infrastructure		3.0%	5.0%	7.0%
Total:			100.0%	

Rebalancing Policy

The Board believes the asset allocation policy determines the majority of return and risk of the Fund. Therefore, the Board intends to keep the actual asset allocation of the Fund close to the target asset allocation. The ranges specified in the table above are a function of the expected volatility of each asset class and the proportion of the total fund allocated to the asset class.

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If the Fund experiences positive cash flow (i.e., contributions exceed disbursements), new contributions will be directed to the under-allocated assets. If the Fund experiences negative cash flow, funds will be withdrawn from

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over-allocated assets to make distributions. If the cash flow is not sufficient to keep an allocation within the defined ranges stated above, then purchase or sale transactions are required to rebalance the Fund.

Rebalancing actions are the responsibility of the TSRS Staff. When asset allocations exceed the ranges indicated above, the TSRS Staff will rebalance to within the target range. Rebalancing actions shall be reported to the Board by the TSRS Staff on a timely basis.

Where particular circumstances arise and Staff determines rebalancing is not prudent, because doing so may generate unnecessary costs or otherwise not be in the best interest of TSRS, a full report of the actions taken or not taken shall be made to the Board at the earliest opportunity.

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Deleted: TSRS' actual asset allocation shall be reviewed at the end of each quarter at a minimum and shall be based on current asset valuations. Estimated values may be used when current asset valuations are not available.¶

Total Fund Performance Objectives

The Fund portfolio has been designed to meet TSRS' long term investment objectives.

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Time Horizon

The Board has adopted a time horizon of at least five years for evaluating the Fund portfolio as a whole, including the evaluation of each asset class and each investment manager relative to established benchmarks.

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Performance Objectives

Based on the analysis used by the Board to develop the asset allocation principles and investment manager structure policy, the Board has identified performance benchmarks and peer groups for each investment category.

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Investment Category	Market Index[1]	Callan Style Group
Total Domestic Equity	Russell 3000 Index	Domestic Equity
Passive Large-Cap Equities	S&P 500 Index	Large Cap Style
Large Cap Value Equities	Russell 1000 Value Index	Large Cap Value Style
Large Cap Growth Equities	Russell 1000 Growth Index	Large Cap Growth Style
Mid Cap Core Equity	Russell Midcap Index	Mid Cap Style
Small Cap Core Equity	Russell 2000 Index	Small Cap Style
Total Non-U.S Equity	MSCI ACWI ex U.S. IMI	International Equity
Core Non-U.S. Equity	MSCI ACWI ex U.S.	Non-U.S. Equity Style
Non-U.S. Equity Small Cap	MSCI ACWI ex U.S. Small Cap	Non-U.S. Equity Small Cap
Fixed Income	Bloomberg Barclays Aggregate Index	Domestic Fixed
Real Estate	NFI-ODCE	Open-End Real Estate
Infrastructure	CPI+4%	NA

[1] The Investment Consultant has advised the Board that broader indexes such as the Russell 1000 and Russell 2000 are the most appropriate measures of success over the long run and that style indexes such as the Russell 1000 Value or Russell 2000 Growth are appropriate for measuring performance in the nearer term when investment managers have distinct growth or value styles.

The primary benchmark for evaluating the performance of the entire Fund portfolio is a Target Index consisting of asset class market indices weighted in accordance with the allocation target. The Target Index is:

S&P 500 Index	27%
Russell 2500 Index	7%
MSCI ACWI ex U.S. IMI	24%
BC Aggregate Bond Index	25%
NFI-ODCE	12%
CPI + 4%	5%
Total	100%

Over a rolling five-year time period the Board expects the Fund to generate returns, after payment of all fees and expenses, which exceed the Target Index return.

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Investment Manager Guidelines

TSRS's investment managers are expected to adhere to the investment guidelines found in this document, unless otherwise noted in an addendum or in a separate written agreement. As a general rule, the Board may specify investment guidelines for separately managed accounts and must agree to the guidelines for commingled vehicles.

An investment manager should contact the TSRS Staff when it believes that deviation from the guidelines would be in the best interest of the pension fund. Any separate account investment manager shall be required to notify TSRS Staff of a deviation from these Guidelines.

Deleted: Approval must be obtained in writing before an investment manager deviates from the guidelines.

General Guidelines

The following broad guidelines reflect the parameters under which the Board desires to achieve its objectives:

- The Investment Manager shall be given full discretion to manage the assets under its supervision subject to these Investment Guidelines and the laws of the State of Arizona.
- Investments will be of a prudent nature and consistent with the best investment practices.

Prohibited / Restricted Transactions

The following transactions are prohibited or restricted unless specifically authorized by TSRS in a separate written agreement:

1. Borrowing of money.
2. Purchase securities on margin or short sales unless used for the purpose of risk control.
3. Pledging, mortgaging, or hypothecating any securities except for loans of securities that are fully collateralized.
4. Purchase securities of the investment managers, its parent, or its affiliates.
5. Purchase or sale of futures or options for speculation or leverage.
6. Purchase or sale of commodities, commodity contracts, or illiquid interests in real estate or mortgages.
7. Purchase of illiquid securities.
8. Use of various futures and options strategies for hedging or for taking limited risks with a portion of the portfolio's assets.

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Securities Trading

The emphasis for securities trading shall be on "best execution"; that is, the highest proceeds to the Fund at the lowest cost, net of all transaction expenses.

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Managers should report brokerage allocation to TSRS as part of the routine reporting process. Managers also should inform TSRS annually regarding any "soft dollar" arrangements between the manager and the brokers and describe the services that are purchased with the soft dollars, if any, generated by pension fund assets. The managers also should regularly inform TSRS of the turnover within their portfolio and be prepared to document the rationale for any significant changes in portfolio turnover.

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Securities Lending

TSRS may enter into securities lending agreements with the Custodian. The securities lending agreements should include credit approval, collateral management investment policies, and indemnification provisions that minimize the risk of principal loss. Loans of U.S. securities are initially collateralized at 102% of the market value of the borrowed securities, if the borrowed securities and the collateral are denominated in the same currency and at 105% if the borrowed security and the collateral are denominated in different currencies.

Proxy Voting

The investment manager(s) are responsible for their portfolios and for making their own assessment of the issues to be voted upon. Managers are expected to vote all proxies received so as to enhance the economic interest of the pension plan. In addition, the managers should maintain records as to the voting of proxies so that TSRS can monitor both the general voting procedures and the specific actions taken. Each manager should submit quarterly reports to the TSRS that addresses proxy voting activity during the prior quarter. In addition, the Board may direct how proxies should be voted on certain issues.

Diversification

The investment manager(s) are responsible for achieving a level of diversification in their portfolio that is consistent with their investment approach. Managers may be retained for portfolios that concentrate in specific market segments. General diversification guidelines may be waived (upon request) for these “special purpose” portfolios.

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General Investment Objectives and Guidelines

Equity Portfolios

U.S. Equity Manager Guidelines

Each U.S. equity investment manager retained by TSRS will follow a specific investment style and will be evaluated against a specific market index that represents their investment style. In the case of active managers, investment results may also be compared to returns of a peer group of managers with similar styles.

This segment may include common and preferred stock, convertible securities, warrants, and cash equivalent securities. General equity guidelines for active managers include the following:

1. Holdings in any one economic sector (e.g. energy) should not exceed more than 4 times the weight of the sector in the benchmark index or 50% of the portfolio's market value, whichever is lower. If a sector has a greater than 50% weight in the index, the maximum exposure to that sector in the portfolio may be as high as its weight in the index.
2. It is expected that the portfolio will be invested primarily in stocks of companies headquartered in the United States. However, the manager has discretion to invest up to 15% of the portfolio in securities of foreign issuers listed on a major U.S. exchange or traded on a major U.S. securities market (including ADRs and ADSs). The manager may invest in other depository receipts and shares as well as non-dollar denominated securities of foreign issuers traded on non-U.S. exchanges. Restriction of depository receipts does not apply to dual listed stocks.
3. Private placements and other restricted securities (including Rule 144A eligible securities) are eligible for purchase, up to 10% of the market value of the Fund assets under management.
4. Equity managers are expected to run fully invested portfolios. In most situations, residual or transitional cash should be no more than 5% of the portfolio market value. If, in a manager's judgment, a higher level of cash is warranted for defensive purposes, the 5% limit may be exceeded, provided prior notification has been given to the TSRS System Administrator. Non-equity assets will be high-quality cash equivalent securities maturing within one year.
5. Larger capitalization portfolios should have a weighted average market capitalization in excess of the weighted average market capitalization of the Russell Midcap Index. Middle capitalization portfolios should have a weighted average market value similar to that of the Russell Midcap Index. Smaller capitalization portfolios should have a weighted average market capitalization less than the weighted average market capitalization of the Russell Midcap Index.

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Non-U.S. Equity Manager Guidelines

This segment may be invested in common and preferred stocks, convertibles, and warrants of companies headquartered outside of the United States. General non-U.S. equity guidelines for active managers include the following:

1. Issues held in the portfolio should be traded on a recognized national stock exchange with adequate liquidity, trading volume, regulations, and breadth of securities. Investments in any single country market should not exceed more than 4 times the weight of the country in the benchmark index or 50% of portfolio assets, whichever is lower. If a country has a greater than 50% weight in the index, the maximum exposure to that country in the portfolio may be as high as its weight in the index.

2. No more than 35% of each manager's portfolio should be invested in "emerging markets" (i.e., markets that are not included in the Morgan Stanley Capital International Europe, Australia, and Far East index).

3. ADRs and other depository receipts are permitted in the portfolio.

4. Private placements and other restricted securities (including Rule 144A eligible securities) are eligible for purchase, up to 10% of the market value of the Fund assets under management.

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U.S. Investment Grade Fixed Income Manager Guidelines

Permissible investments include marketable government, corporate, and mortgage-backed bonds and cash equivalent securities.

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- For passive investment strategies, it is expected that the portfolio will be managed to replicate the performance of the underlying index. Therefore, overall characteristics of the portfolio should be similar to that of the index (including, but not limited to quality, sector, and duration characteristics).

Diversified Fixed Income Manager Guidelines

The manager will be allowed to invest in those securities listed in applicable the investment management agreement. General fixed income guidelines for active managers include the following:

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- Duration of the total portfolio should be within 30% of the custom benchmark which is defined as 25% Barclays Mortgage, 25% Barclays Credit, 25% Barclays High Yield, 25% JPM EMBI Global.

- The maximum position in a single issuer (excluding obligations of U.S. Government and its Agencies) should not exceed 5% of the portfolio's assets at current market value.

- The portfolio should maintain an average quality of at least "BB+".

- Money Market instruments must be rated in one of the two highest categories by a nationally recognized rating agency.

- The minimum rating for individual issues should be CCC (based on market value) as rated by Moody's, S&P, or Fitch. Should an issue be downgraded below the minimum, the manager will determine the appropriate action to be taken.

Alternative Asset Managers

The Board may employ funds, funds of funds, exchange traded funds, mutual funds or separate account management to pursue investments in "alternative assets" for the purpose of diversifying the market exposure of the Fund, to reduce correlations to equity and fixed income investments, and/or to enhance returns. These might include, without limitation, managers or partnerships investing in leveraged buyouts, distressed debt, venture capital, natural resources, hedge funds, private real estate, infrastructure, or other asset classes/strategies. These investments will not generally fall within the guidelines established for the more traditional asset classes that make up the majority of the Fund's investments.

The Board shall consider certain criteria to evaluate alternative asset managers including, but not limited to:

1. Tenure and track record of management as a team;
2. Expertise in targeted areas of investment;
3. Diversification relative to other investments;
4. Use of Leverage;
5. Liquidity of investments;
6. General Partner investment, fees and potential conflicts of interest; and
7. Unrelated Business Income Tax.

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Investment Manager Selection and Evaluation

Investment Manager Selection

The Board will utilize a process for investment manager selection that embodies the principles of procedural due diligence. Accordingly, when selecting investment managers, the Board will employ a competitive search process, including the following steps or such other steps as the Board determines in the situation:

1. Formulation of specific investment manager search criteria that reflect the requirements for the investment manager role under consideration.
2. Identification of qualified candidates from the manager search database maintained by the Investment Consultant and such other sources as determined by the Board.
3. Analysis of qualified candidates in terms of:
    a) Quantitative characteristics, such as CFA GIPS-compliant composite return data, risk-adjusted rates of return and relevant portfolio characteristics.
    b) Qualitative characteristics, such as key personnel, investment philosophy, investment strategy, research orientation, decision- making process, and risk controls.
    c) Organizational factors, such as type and size of firm, ownership structure, client-servicing capabilities, ability to obtain and retain clients, and fees.
4. Selection and interview of finalist candidates based on a due diligence report prepared for the Board by the Investment Consultant summarizing the analysis described above.

Manager Communication Guidelines

TSRS will be in regular communication with their Investment Managers and will require informal and formal communication channels. There are four basic elements of the communications program: 1) on-site due-diligence meetings, 2) quarterly reporting, 3) monthly reporting, and 4) event-driven reporting.

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Manager Evaluation and Review

With the assistance of the TSRS Staff and the Investment Consultant, the Board will evaluate each Investment Manager from a quantitative and qualitative standpoint on a quarterly basis. In evaluating all Investment Managers, the Board will consider qualitative factors likely to impact the future performance of the portion of the Fund managed in addition to current and historical rates of return.

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The Board believes that it is appropriate to include "objective standards" designed to guide future decisions regarding investment managers.

1. **Qualitative Review**

   The Board will evaluate qualitative factors relating to an investment manager, including:

   - Ownership changes (e.g., key people "cash out")
   - Key people leave firm
   - Conflict of Interest
   - Changes in investment strategy the investment manager was employed by the Board to implement
   - Investment manager is involved in material litigation or fraud
   - Material client-servicing problems

2. **Quantitative Review**

   Long-term performance standards used by the Board should measure an investment manager's performance from inception and on a rolling five-year returns basis in relation to a broad market index or indices that the investment manager previously agreed to be measured against.

   Shorter-term performance will be measured in relation to an appropriate style index and "Peer Group". Each investment manager is to be measured against the median return of a previously agreed-upon peer group of investment managers with similar investment styles.

   Managers are expected to maintain their stated investment style and philosophy. Quantitative measures of investment style and philosophy include style mapping, style attribution analysis, and tracking error relative to the benchmark. TSRS with the assistance of the Investment Consultant will monitor these factors on a quarterly basis.

Notwithstanding any other provision of this Investment Policy Statement or TSRS, the Board retains the right to terminate the contract with, and the services provided to the Board by, an investment manager at any time. The Board believes that the decision to retain or terminate an investment manager or other Service Provider should be based on reasoned judgment and confidence in the investment manager's or other Service Provider's ability to perform in the future.

Investment Policy Review

The Board will review this Investment Policy Statement periodically to ensure that it remains relevant and appropriate. The Investment Policy Statement may be amended at any time by majority vote.

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Benchmarks¶
Investment Allocation ...

Callan

September 24, 2020

Tucson Supplemental Retirement System

Real Estate Review:

Market and Managers

Paul Erlendson
Senior Vice President

Gordie Weightman, CFA
Senior Vice President

Munir Iman
Assistant Vice President

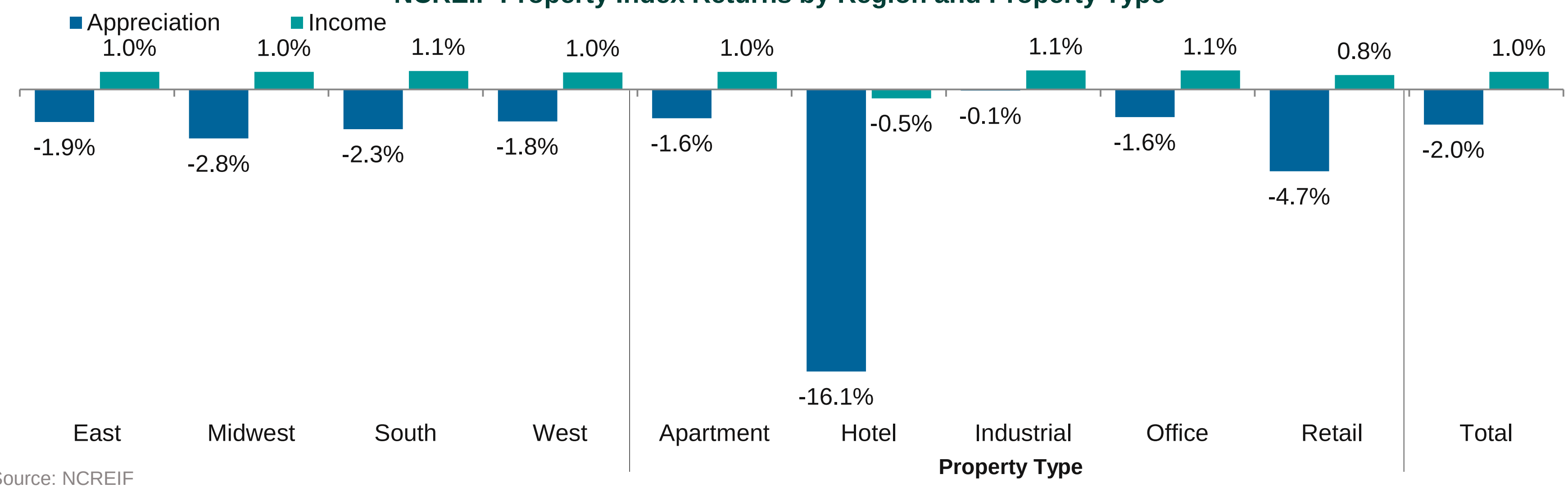
U.S. Private Real Estate Market Trends

Results

– Pandemic's continued impact reflected in 2Q results
– Income remains positive except in Hotel sector
– All sectors experienced negative appreciation, Industrial remains the best performer
– Dispersion of returns by manager within the ODCE experienced a 450 basis point spread

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
NCREIF ODCE	-1.6%	2.2%	5.7%	7.3%	10.8%
Appreciation	-2.5%	-1.8%	1.4%	2.9%	5.8%
Income	0.9%	4.1%	4.2%	4.3%	4.8%
NCREIF Property Index	-1.0%	2.7%	5.4%	6.8%	9.7%
Appreciation	-2.0%	-1.7%	0.9%	2.1%	4.4%
Income	1.0%	4.4%	4.5%	4.6%	5.2%

NCREIF Property Index Returns by Region and Property Type



Source: NCREIF

Real Estate Market Update – COVID-19

Prior to the COVID-19 pandemic, the overall real estate market was relatively healthy from a fundamental standpoint, albeit there were indications of the market being late in the cycle. Positive indicators included strong occupancy, upward rent growth and steady transaction volumes. However, moderating total returns and the flattening of property value appreciation, particularly in the retail sector, was resulting in cautiousness.

While the impact of the pandemic on real estate will continue to play out over time, it is clear that all property types have and will be negatively impacted by the crisis, to varying degrees. The market consensus suggests that retail properties will be the most negatively impacted out of the four main property types. This will be followed by office, with industrial and apartments remaining the most relatively resilient. This outlook has been supported rent collection figures, with retail by far the lowest, and apartments the strongest.

Rent collections for core institutional managers have remained strong thus far across (>90%) among Industrial, Apartment, and Office. Apartment collections have experienced softness in major cities, particularly in high-rise assets. Office rent collections have remained strong thus far, but the uncertainty around the strength of the underlying tenants coupled with the impact of the remote working shift and how that may impact demand has increased the risk of the property sector.

Retail tenants across sub-property types are under pressure. Bankruptcy filings of anchor tenants in malls and shopping centers have reduced foot traffic hampering an already struggling sector. Rolling shutdowns due to COVID outbreaks vary from state to state and have accelerated the shift of consumer behavior to ecommerce. Retail rent collections (<50%) broadly and within malls (<25%) will continue to suffer.

Although the transactions market has come to a halt, the crisis will eventually bring about some buying opportunities for managers poised to take advantage. This will be dictated by capital availability by newer funds with dry powder and limited existing exposure. The lower interest rate environment is anticipated to aid the transactions as the market emerges from the pandemic.

Post COVID-19 Property Sector Risk Assessment

The below represent one managers' risk assessment of the various property types.

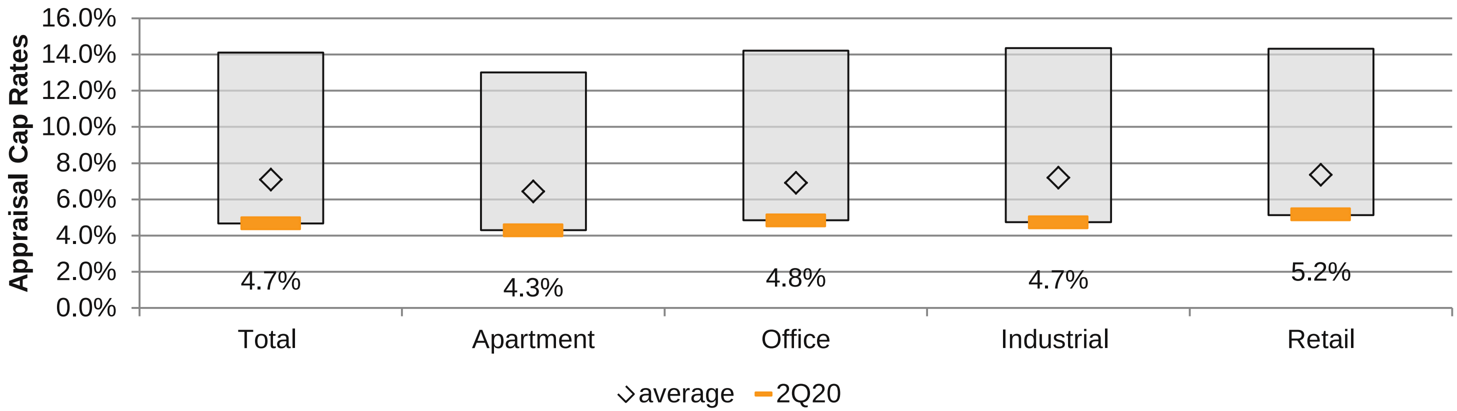
Sector	COVID-19 Operational Impact	Historical Economic Sensitivity	Near-term Repricing	Repricing risk today vs. GFC?	Long-term Risks: Change due to COVID-19
Apartments	Medium	Medium	Medium	Neutral	Low
Medical Office	Medium	Low	Low	Lower	Low
Self-Storage	Medium	Low	Low	Neutral	Low
Industrial	Medium	High	Low	Lower	Low
Student Housing	High	Low	Medium	Higher	Medium
Malls	High	High	High	Higher	Medium
Strip Centers	High	High	High	Neutral	Medium
Office	Medium	High	Medium	Higher	Medium
Senior Housing	High	Medium	High	Neutral	Medium
Lodging	High	High	High	Higher	Medium

Source: Heitman Research

Returns Continue to Decline

2Q 2020 Survey of Investors	Historical Annualized Returns for the NPI 2017	2018	2019	2015 to 2019	2Q 2020 Survey of Investors Projected Annualized Returns for the NPI 2020	2021	2022	2020 to 2024
NPI Total Return	7.0%	6.7%	6.4%	8.3%	-4.0%	3.6%	7.6%	4.7%
Income Return	4.7%	4.6%	4.5%	4.7%	4.0%	4.7%	4.7%	4.6%
Capital Appreciation	2.2%	2.1%	1.8%	3.4%	-7.9%	-1.1%	2.9%	0.1%

NCREIF Cap Rates by Property Type 2Q 2000 -2Q 2020



Source: PREA, NCREIF, at 2Q 2020. NPI is a property level index of core operating properties. Cap rate chart shows range (high to low) with the average indicated by the diamond and the current cap rates shown in orange. Capitalization Rates are determined by dividing Property Income by Market Value

U.S. Private Real Estate Market Trends

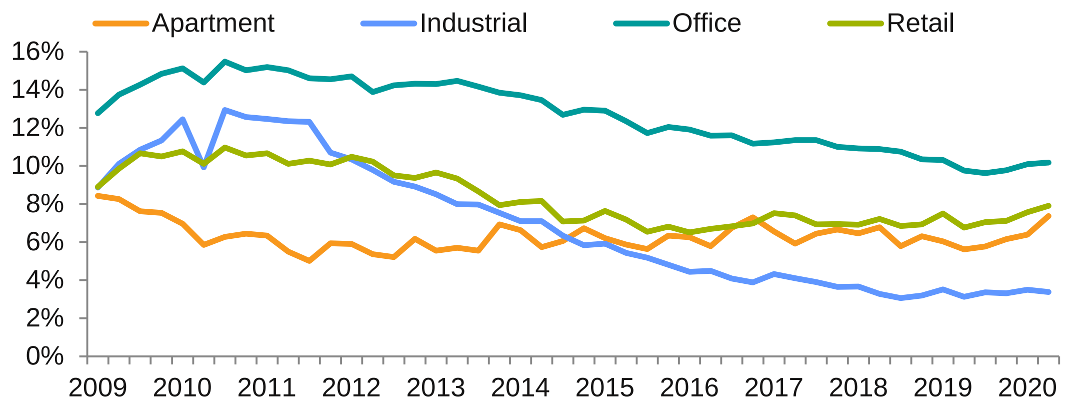
2Q 2020

U.S. real estate fundamentals

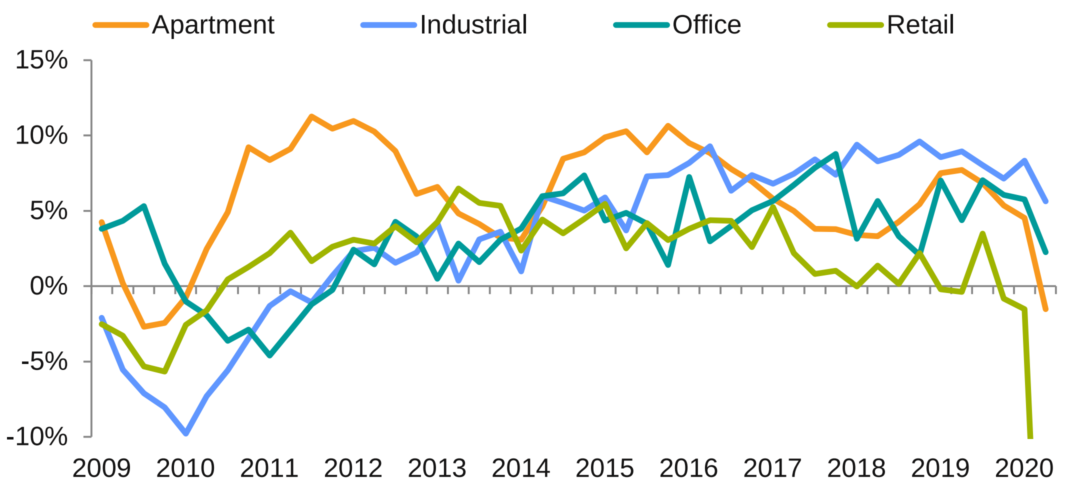
- Vacancy rates for all property types are or will be impacted. The second quarter saw a sharp uptick in apartment vacancies from 6.4% to 7.4%.
- Net operating income fell sharply in the second quarter across all sectors and was most prominent in the retail sector, which fell from -1.5% in 1Q 2020 to -32.7% in 2Q 2020, followed by apartment, which fell from 4.5% to -1.5%.
- Second quarter rent collections show relatively stable collections throughout the quarter in the industrial, apartment, and office sectors. The retail sector remains challenged, with regional malls impacted most heavily.
- Supply was in check prior to the pandemic.
- Construction is limited to finishing up existing projects but has been hampered by shelter in place and material shortages.
- New construction will be basically halted in future quarters except for pre-leased properties.

Source: NCREIF

Vacancy by Property Type

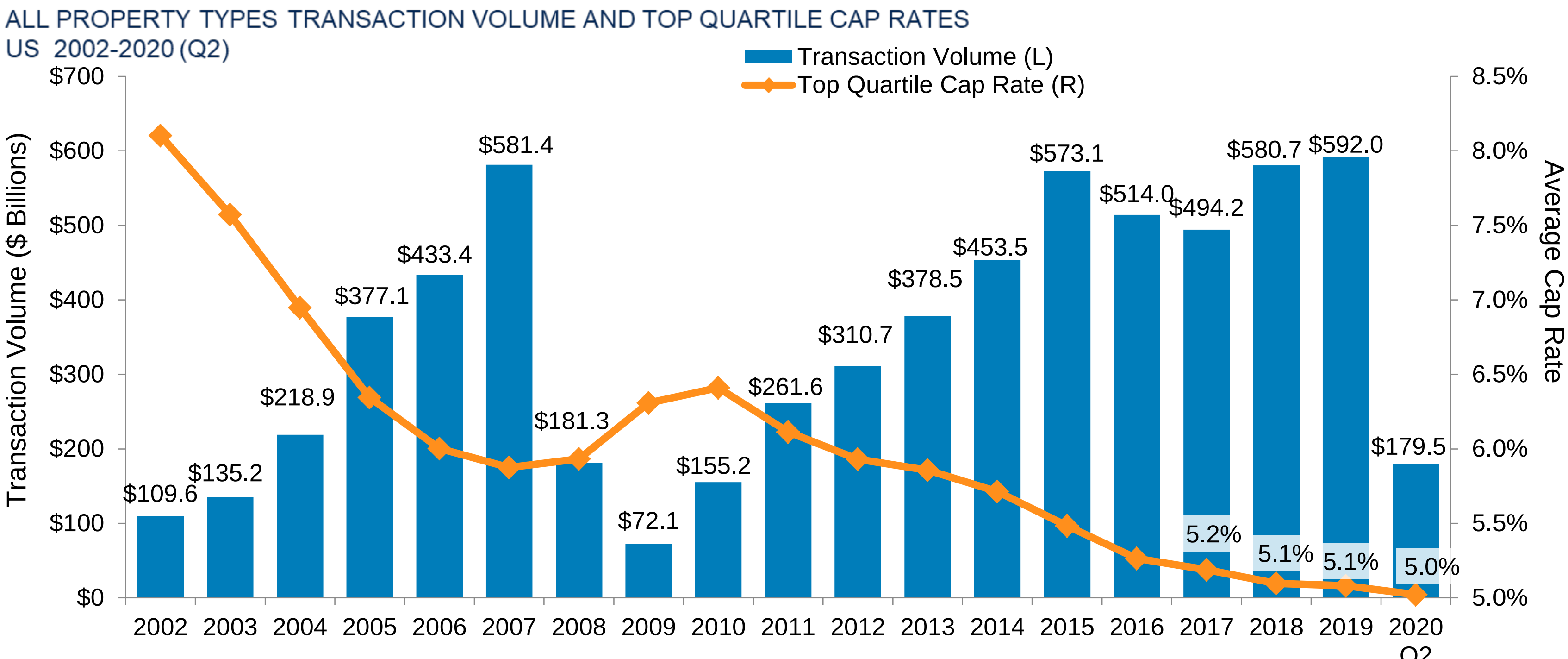


4-Quarter Rolling Net Operating Income Growth by Property Type



Callan

Transaction Volume Ground to a Halt



Source: Real Capital Analytics; Heitman Research

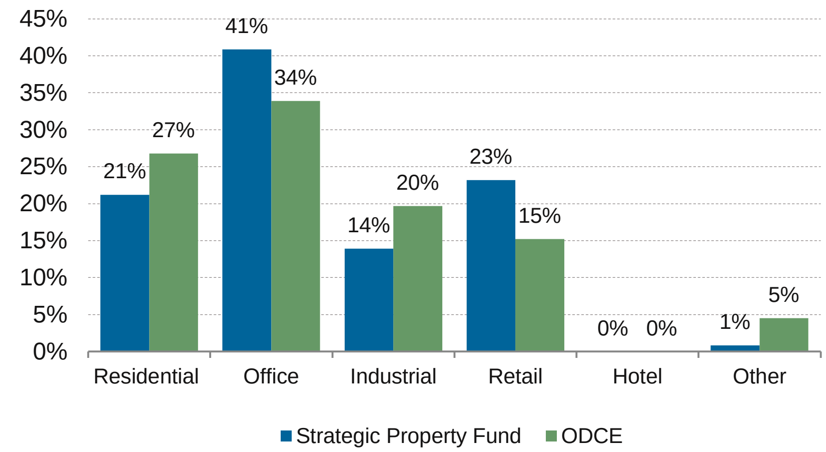
- Transaction volumes were healthy in the first part of the year, but ground to a halt with transactions being cancelled even where there were material non-refundable deposits. Transaction volume is down 29.5% in 1H 2020 from 1H 2019.
- Cap rates remained steady during the quarter. The spread between cap rates and 10-year Treasuries is relatively high, leading some market participants to speculate that cap rates will not adjust much. Price discovery is occurring and there are limited transactions.
- Callan believes that the pandemic may cause a permanent re-pricing of risk across property types. Property types with more reliable cash flows will experience less of a change in cap rates, while those with less reliable cash flows will see greater adjustments.

J.P. Morgan Strategic Property Fund (SPF)

Fund Overview

Fund Structure:	Commingled Fund
Total Fund Assets - Gross	$40,860 mm
Total Fund Assets - Net	$30,674 mm
% of Leverage:	24.9%
Queue:	$247mm entry / 2,922mm exit
Cash:	$875 mm
# of Institutional Investors	381
Redemption as % of NAV	9.5%

Property Type Diversification vs. ODCE



Liquidity and Debt

– Total Credit Line Size: $1,250 million. As of 06/30/2020, $600 million was drawn, indicating $650 million of available capacity

– Weighted Average Cost of Debt: 3.73%, comprised of 91.72% fixed-rate debt and 8.28% floating-rate debt

– 3.07% of total debt maturing over the next 12 months, 9.24% maturing over the subsequent 12 months

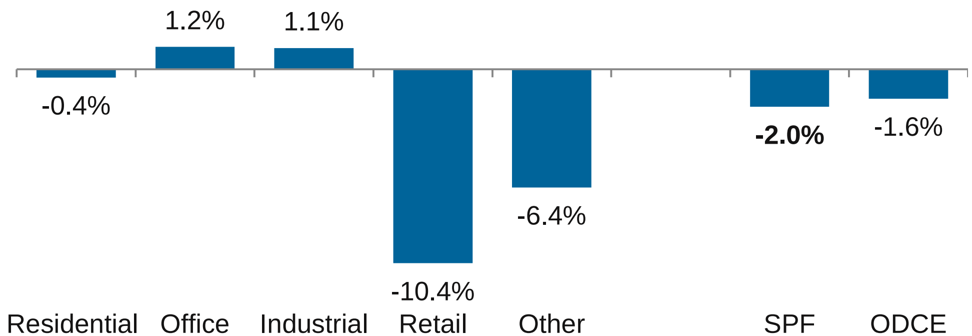
Other

– In the second quarter, the Fund closed on its single family rental development venture, American Homes 4 Rent. This programmatic joint venture will develop approximately 2,500 single family rental homes, located primarily in the Southeast and Sunbelt regions. The COVID-19 pandemic has appeared to benefit the single family rental sector, as tenant demand for more space in suburban markets has been accelerated.

J.P. Morgan Strategic Property Fund (SPF)

Performance

– 2Q 2020 Gross Total Return: -2.02% (vs -1.55% NFI-ODCE VW)
  – Income Return: 0.87%
  – Appreciation Return: -2.88%



Quarterly Asset Growth

Beginning Market Value	$52,623,958
Net New Investment	$-386,573
Investment Gains/(Losses)	$-1,183,842
Ending Market Value	$51,053,543

Strategic Property Fund	Rent Collections
Residential	96%
Office	95%
Industrial	96%
Retail	47%

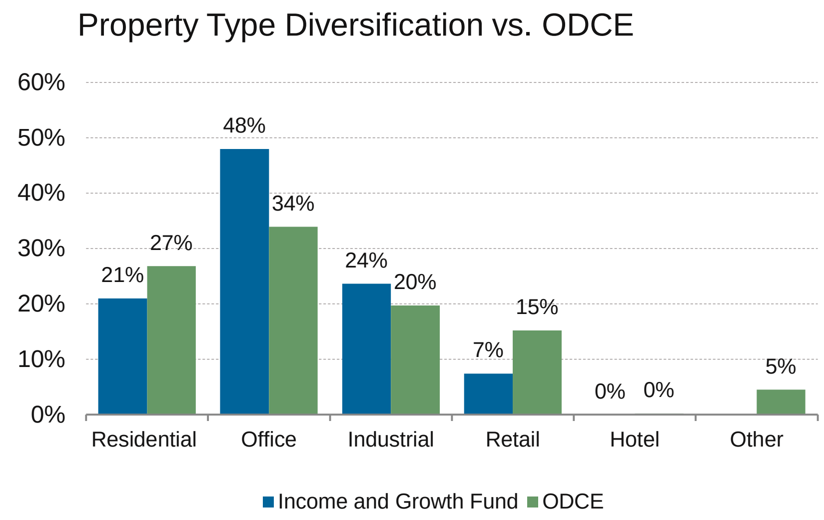
Appraisals/Valuations

– 2Q 2020 Valuation Changes:
  – Apartment: -30 bps, due to negative new lease trade outs and occupancy challenges due to COVID-19, assumptions of lower starting rents and lower near term market rent growth
  – Industrial: +5 bps, driven by increased market rents at various industrial assets, as well as some burn off of free rent and lease ups at other properties.
  – Office: -1 bp, driven upward by positive contractual momentum and increased market rents in Boston and San Francisco assets, but offset by depreciation of New York City assets to reflect lower market rents, lower near-term rent growth, and higher tenant improvement costs.
  – Retail: -265 bps, due to headwinds in near-term fundamentals and challenges of centers in various stages of re-opening.

J.P. Morgan Income and Growth Fund

Fund Overview

Fund Structure:	Commingled Fund
Total Fund Assets - Gross	$3,898 million
Total Fund Assets - Net	$2,384 million
% of Leverage:	38.8%
Queue:	$42mm entry/ $265mm exit
Cash:	$238 million
# of Institutional Investors:	51
Redemption as % of NAV	11.1%



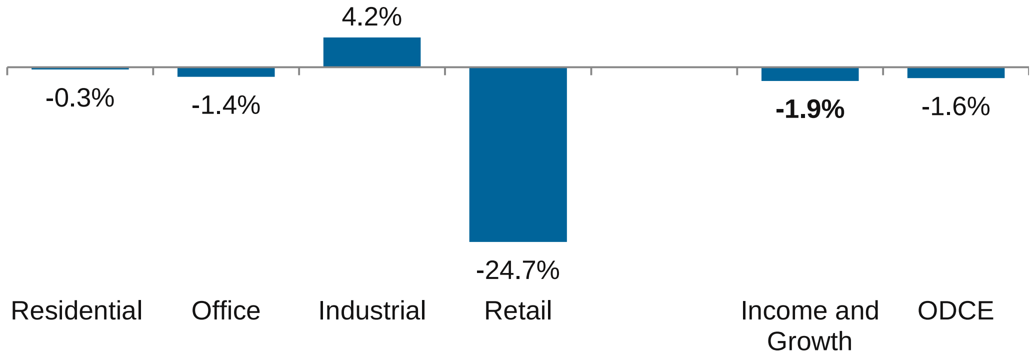
Liquidity and Debt

– Total Credit Line Size: $200 million. As of 06/30/2020, $8 million was drawn, indicating $192 million of available capacity.
– Weighted Average Cost of Debt: 3.60%. Cost of fixed-rate debt was 3.84% and cost of floating-rate debt was 2.81%.
– 10.49% of total debt maturing over the next 12 months, 13.55% maturing over the subsequent 12 months

J.P. Morgan Income and Growth Fund

Performance

– 2Q 2020 Gross Total Return: -1.93% (vs -1.55% NFI-ODCE VW)
  – Income Return: 0.74%
  – Appreciation Return: -2.69%



Quarterly Asset Growth

Beginning Market Value	$25,587,876
Net New Investment	$-185,564
Investment Gains/(Losses)	$-557,915
Ending Market Value	$24,844,397

Income and Growth	Rent Collections
Residential	98%
Office	98%
Industrial	91%
Retail	52%

Appraisals/Valuations

– 2Q 2020 Valuation Changes:
  – Retail sector accounted for majority of write-downs, which includes one regional mall, three power enters, and five neighborhood or community centers. Impact of write-downs was mitigated by a reduced allocation to retail, at 7%.
  – Industrial fundamentals proved resilient as consumers turned to online shopping to avoid shopping in public places.

Conclusions & Takeaways

Institutional Landscape

– Commercial Real Estate remains challenged in the near term. If the economic outlook holds, and a gradual recovery continues into 2021, the general expectation is that core real estate should rebound accordingly. CRE remains an attractive asset class (e.g., consistent cash flow, potential inflation hedge, and appreciation opportunity) and will likely experience a surge in capital flows as the market recovers, which could moderate returns over the next few years.

J.P. Morgan Strategic Property Fund

– **Strengths:** The Fund benefits from strong organizational leadership and is well-positioned with a healthy balance sheet. The Fund has been aggressive with write-downs and has reduced its retail exposure over the past several quarters.

– **Considerations:** The Fund’s overweight to retail is a consideration, given the pandemic’s impact to the retail sector. However, the Fund’s retail assets are high-quality and have experienced strong demand since reopening. Overweight to office sector, which has uncertainty going forward.

J.P. Morgan Income and Growth Fund

– **Strengths:** Moderate leverage relative to core plus funds at 39%. Overweight to industrial and underweight to retail should continue to benefit the Fund.

– **Considerations:** Overweight to office sector, which has uncertainty going forward. Performance has been challenged, particularly with retail assets in the second quarter.

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The New York Times | https://nyti.ms/32zlNGh

Fed Pledges Low Rates for Years, and Until Inflation Picks Up

The Federal Reserve's latest economic forecasts suggest that interest rates will remain near zero at least through 2023.

By Jeanna Smialek

Sept. 16, 2020

WASHINGTON — Federal Reserve officials expect to leave interest rates near zero for years — through at least 2023 — as they try to coax the economy back to full strength after the pandemic-induced recession, based on their September policy statement and economic projections released Wednesday.

The Fed, in a significant update to its official policy statement, also reinforced its August pledge to tolerate slightly higher price gains to offset periods of weak inflation, underscoring that its chairman, Jerome H. Powell, and his colleagues plan to be extraordinarily patient as they try to cushion the economy in the months and years ahead.

The Fed's moves are in response to two major challenges. The coronavirus pandemic continues to threaten the economy in the near-term, leaving millions out of work, and central bank policy will be key to restoring growth and a strong labor market. A longer-run problem centers on inflation and interest rates, which have been slipping lower, threatening economic stagnation. Officials are hoping that an extended period of very cheap money will fuel demand and lift prices.

In its statement on Wednesday, the policy-setting Federal Open Market Committee said it expected to hold rates steady near zero until the job market reaches what it sees as full employment "and inflation has risen to 2 percent and is on track to moderately exceed 2 percent for some time."

By scrapping their old practice of raising rates in response to a drop in unemployment and an expectation that inflation would rise — and instead requiring inflation to show up in real life as a precondition for higher rates — central bankers are committing themselves clearly to their new policy strategy and to a long period with borrowing costs near zero.

"Effectively we're saying rates will remain highly accommodative until the economy is far along in its recovery," Mr. Powell said at a news conference following the meeting, repeatedly calling the messaging "strong" and "powerful."

The change was important enough to prove contentious. Two officials, Robert S. Kaplan from the Federal Reserve Bank of Dallas and Neel Kashkari from the Minneapolis Fed, voted against Wednesday's decision. Mr. Kaplan favored retaining greater flexibility about future rate setting — suggesting that he did not want to intertwine interest rates so tightly with real-life inflation outcomes. Maintaining some wiggle room would leave the Fed room to raise rates earlier.

Mr. Kashkari seemed to take the opposite tack. He believes the committee should "indicate that it expects to maintain the current target range until core inflation has reached 2 percent on a sustained basis," the statement said, arguably a stronger commitment to a period of very-low rates.

Roberto Perli, an economist at Cornerstone Macro who formerly worked at the Fed, said the announcement codified a meaningful change to the Fed's approach.

"What strikes me is how high a bar they set for raising rates," Mr. Perli said. "The message is plenty clear: We want to maximize employment and inflation better come up, or no rate hikes here."

The Fed slashed interest rates to near zero almost exactly six months ago, as the pandemic first swept the United States and markets tiptoed on the brink of disaster. Such low interest rates help to spur economic growth by encouraging home refinancing, business investment and other types of borrowing. While investors and economists already expected borrowing costs to remain at rock-bottom for years, the Fed's declaration on Wednesday should buttress that outlook.

Mr. Powell tried to hammer that point home, saying that the changes "clarify our strong commitment over a longer time horizon."

Officials clearly expect that sustained economic support will be needed. During his news conference, Mr. Powell noted that while activity had picked up, the recovery in household spending probably reflected "substantial and timely" fiscal support, and services that involved people gathering together — like entertainment and tourism — would struggle to fully recover until the virus abated.

"Overall activity remains well below its level before the pandemic, and the path ahead remains highly uncertain," Mr. Powell said.

Cutting the federal funds rate is not the only tool in the Fed's arsenal — the central bank is also buying huge quantities of mortgage-backed and Treasury securities. The primary goal of those purchases has been to stabilize markets, but bond-buying can help to stimulate the economy by pushing down longer-term interest rates. It can also prod investors to move into riskier assets with higher payoffs, driving them toward corporate bonds and stocks.

Fed officials had been mulling when and how to update their asset purchase program, and said Wednesday that they would maintain purchases "at least" at their current pace to "sustain smooth market functioning and help foster accommodative financial conditions."

Mr. Powell said that the purchases were helping to keep credit flowing in the economy.

"There are various ways and margins that we can adjust our tools going forward, and we'll continue to monitor developments," he said.

Even so, the Fed's powers are limited and the central bank head once again noted that more fiscal support — the kind of direct spending that only Congress can authorize — would be needed to help the economy continue its recovery.

"My sense is that more fiscal support is likely to be needed," he said.

Millions of people remain out of work and it is unclear how quickly — or even if — all of those workers will find re-employment.

Fed officials now expect the unemployment rate to average 7.6 percent over the final three months of the year, based on the median forecast, which is lower than they had previously expected but still sharply higher than the 3.5 percent rate that prevailed heading into the downturn. Those projections were included in the Fed's updated Summary of Economic Projections, a set of estimates for how the economy and interest rates will develop in coming years. It was the so-called S.E.P. that showed interest rates on hold through 2023, based on the median forecast.

"The labor market has been recovering, but it's a long way, a long way, from maximum employment," Mr. Powell said, adding that the recovery will move most quickly through areas that were not directly affected by the virus. Parts of the economy facing a direct hit — like airlines, sports stadiums and restaurants — "are going to be challenging for some time."

"It's millions of people," he said, adding that it is the Fed's job "not to forget those people."

As part of that effort, Mr. Powell in August announced that the Fed was shifting its policy strategy, and no longer planned to lift interest rates simply because the unemployment rate had dropped below levels it saw as sustainable. That came alongside the shift to average inflation targeting, which will allow prices to run slightly higher than 2 percent at times.

The September statement backed up that move.

"The committee will aim to achieve inflation moderately above 2 percent for some time so that inflation averages 2 percent over time and longer-term inflation expectations remain well anchored at 2 percent," the Fed said Wednesday. Previously, it had pledged to aim for 2 percent inflation on a "symmetric" basis, meaning that the Fed was equally unsatisfied if inflation ran above or below the target.

"If we do lift off, we will keep policy accommodative until we have a moderate overshoot of inflation for some time," Mr. Powell said.

Inflation in the United States has slipped lower over recent decades along with sustainable growth and interest rates. Similar trends have played out in Europe and especially Japan, where inflation has slipped stubbornly lower despite aggressive central bank interventions in recent years.

Nudging price gains slightly higher would buy Fed officials more room to stimulate the economy when needed, since rates incorporate inflation. A little inflation is also thought to grease the wheels of the economy, giving employers room to pass along price increases and raise wages.

"To the extent that inflation gets lower and lower and lower, interest rates get lower and lower," Mr. Powell said. "This isn't some idle academic theory, this is what's happening all over the world — if you look at many, many large jurisdictions around the world, you are seeing that phenomenon."

Jeanna Smialek writes about the Federal Reserve and the economy. She previously covered economics at Bloomberg News, where she also wrote feature stories for Businessweek magazine. @jeannasmialek

A version of this article appears in print on Sept. 17, 2020, Section B, Page 1 of the New York edition with the headline: Fed, Coaxing Growth, Sees Near-Zero Rates for Years

Private infrastructure investors see opportunity amid COVID-19 fallout

BY HIL ANDERSON (/ABOUT/EDITORIAL-TEAM/#HILANDERSON) | SEPTEMBER 16, 2020 | FEATURED (HTTPS://TRANSPORTATIONTODAYNEWS.COM/FEATURED/)

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While Washington seems deadlocked in its election-year response to the COVID-19 pandemic, international investors see growing opportunities to strike deals on transportation infrastructure projects directly with state and municipal governments.

Voters across the United States still favor campaign-promised improvements to all types of public infrastructure, and going directly to the front lines with ideas for projects and the capital to get them off the ground may be a productive option rather than waiting for the Trump administration or a deadlocked Congress to take the lead.

“The pandemic hit and that, understandably, rearranged everyone’s priorities,” said DJ Gribbin, a former special assistant on infrastructure policy to the Trump administration. “But the good news is that infrastructure is still getting a fair amount of attention.”

Brian McGuire, President & CEO of Associated Equipment Distributors on the importance of a federal infrastructure bill and how AED has handled business during the pandemic. (https://transportationtodaynews.com/podcast/18544-brian-mcguire-president-ceo-of-associated-equipment-distributors-on-the-importance-of-a-federal-infrastructure-bill-and-how-aed-has-handled-business-during-the-pandemic/)

Investment News

U.S. Department of Transportation awards $1B in infrastructure grants (https://transportationtodaynews.com/news/19698-u-s-department-of-transportation-awards-1b-in-infrastructure-grants/)

Federal funds aid Massachusetts interchange improvements (https://transportationtodaynews.com/news/19690-federal-funds-aid-massachusetts-interchange-improvements/)

House Republicans roll out "Commitment to America" plan (https://transportationtodaynews.com/news/19687-house-republicans-roll-out-commitment-to-america-plan/)

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Gribbin and the other speakers at the Sept. 15 virtual panel discussion organized by the Global Infrastructure Investment Association (GIIA) considered conditions to be ripe for private capital to make its presence known at state capitals and city halls nationwide that are looking for ways to jumpstart infrastructure projects as a means to create jobs and otherwise improve the lives of their constituents who still need to travel and transport products.

"We don't need a lot of federal support," said Gribbin, who is currently a consultant and Senior Operating Partner at Stonepeak Infrastructure Partners. "What we need is action at the state and local levels."

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Although COVID-19 may have sent many municipal governments reeling, they are still often blessed with airports and other enticing infrastructure assets to attract the attention of well-capitalized major investors eagerly looking for new projects in which to invest. "We have a trillion-dollar infrastructure gap in the country, yet private investors cannot find projects," said Michele Nellenbach, Director of Strategic Initiatives at the Bipartisan Policy Center.

Moreover, the panel concurred that with Congress unlikely to act any time soon on major infrastructure spending and with gasoline tax revenues slumping, striking a private-public partnership (P3) deal with an investor group may be the only practical way to move forward. And investors are recognizing that they can play an active role in seeking out partners at the state and local levels and communicating with them directly as opposed to waiting for a still-elusive infrastructure spending bill to stumble off Capitol Hill.

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“We can go to a city, county or state and tell them, ‘If you know you need a new bridge or school built, then it’s a perfect time to do a project,’” said Gribbin.

At the same time, investors could urge these local partners to allow the private sector access to existing infrastructure, particularly airports, and turn them into revenue generators that will provide funding for infrastructure maintenance and lesser projects that will address crowded roads, skimpy broadband service, and myriad other issues that the public can get behind.

Nellenbach said cash-strapped city governments often have no solid idea of the value of their existing infrastructure in terms of leasing or privatization. She urged city leaders to quickly begin taking inventory of their holdings to find out what their current needs are and, equally as important, what will be required down the road in terms of infrastructure expansion and maintenance.

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By working with private investors rather than depending on the whims of Washington and the bond market to obtain financing, the GIIA panel saw advantages in terms of capital costs and in overall better planning for the long term. Tom Osborne, Executive Director of IFM Investors in New York City, urged changes to accounting rules to project costs out over a number of years rather than "how much it will cost just to get it built."

"State and local governments are going to have to find new revenue sources," Osborne said. "And it will have relevance to either a Democratic or Republican administration."

← Florida Turnpike wins International Bridge, Tunnel and Turnpike Association award (https://transportationtodaynews.com/news/19667-florida-turnpike-wins-international-bridge-tunnel-and-turnpike-association-award/)
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Public Pensions' New Inflation Dilemma

BY: Girard Miller | September 15, 2020

To signal its intent to let the economy run a wee bit "hot" after the recession's end, seeking to restore full employment, the Federal Reserve has announced that it will fiddle with its inflation targets. It now calculates its trigger points over long periods, so it won't hit the brakes prematurely at the first sign of inflation. Meanwhile, the Fed has also crammed interest rates down by sopping up trillions of recent years' new deficit-funding U.S. Treasury bonds, which monetary mavens expect to later cause future inflation, perhaps toward the end of this decade.

As a result, there's a new problem on the horizon for public pensions, one that will call for some thoughtful reassessments of the always fraught assumptions that underlie their funding structures.

The problem begins with bonds. One important consequence of these Fed actions is that the "real" yields (net of inflation) on Treasury Inflation-Protected Securities are now negative, ranging from minus 0.3 percent to minus 1.3 percent depending on when they mature. This has profound importance for pension funds. It means that today there is no way to secure inflation protection from risk-free government bonds without giving up principal. As a result, riskier assets like stocks and real estate may no longer provide a "free lunch" to protect retirees from future inflation while also reliably providing sufficient investment returns to fund the pensions.

When I began my career in public finance decades ago, a rough rule of thumb was that historical inflation rates over 50 years were 3 percent, while stocks yielded 10 percent and bonds returned 5 percent. So a diversified 60/40 portfolio of stocks and bonds was thus expected to return 8 percent before inflation and 5 percent net of inflation.

Let's fast-forward to today. Inflation expectations are now much lower than 3 percent, and the Fed has restated its 2 percent target. But high-quality bonds — not just the risk-free ones — no longer yield enough income to amply exceed even that level of inflation. So have public pension systems' portfolio investment-return expectations adjusted appropriately? And what are the actuarial implications for the retired-and-retiring baby-boom generation vs. the younger workers who joined these plans more recently?

Amid the rampant inflation of the 1970s, many public pension plans committed themselves to providing cost-of-living allowances to retirees. But the ground has shifted beneath us, and in today's market environment long-held plan-design assumptions no longer apply. Public employers and prudent public plan fiduciaries should schedule a "21st Century Inflation Chat" with their actuaries and consultants. It would help to educate employees, retirees and other stakeholders about the new drought parching their communal COLA money tree.

A good place to start is with the pension plans' investment and inflation assumptions. The most authoritative, highly respected source of data on this topic is the National Association of State Retirement Administrators. NASRA's annual Public Fund Survey is diligently compiled by the forthright Keith Brainard. The most relevant data from the latest NASRA survey is contained in Figure 2 from its accompanying issue brief. The data, displayed here, tracks the averages for public pensions' investment and inflation assumptions from 2002 to 2018:

• Between 2002 and 2018, pension funds reduced their composite annual investment-return expectations by 83 basis points (0.83 percent) , from 8.05 to 7.22 percent. This is widely hailed as a movement to realism, although it mostly reflects the steep decline in bond yields.

• Inflation expectations built into the pension plans' actuarial calculations have declined even more sharply, by 116 basis points, from 3.84 to 2.68 percent per annum. (Note that, actuarially, lower actual inflation would beneficially reduce the plans' future baby-boomer COLA liabilities.)

• The plans' average assumed annual real rate of return (net of inflation) has thus increased over the past decade, by 33 basis points, from 4.21 to 4.54 percent. That uptrend seems dubious.

Stocks and popular "hard assets" like gold now trade at premium prices. Bond yields are the lowest in our lifetimes, pushing their market prices to record levels that will suffer badly if inflation returns. So the central question that pension decision-makers must ask themselves is whether it is now realistic to expect that the real rates of return on pension portfolios will remain persistently higher for decades to come, and particularly if monetary inflation erupts.

The second question, and perhaps the most directly relevant to their inflation enigma, is whether public pension plans can continue to rely on the backstop that financial markets had historically given them to cover the COLAs baked into the benefits payable to retirees.

I fully realize that this stirs up a hornet's nest that most folks in the pension world would much prefer to sidestep. My point here is not to deprive current retirees of benefits they were promised or to take away benefits already earned by current employees. But it's time for honest, independent assessments of the long-held assumptions that investment returns can be sufficient to fund COLAs indefinitely while also paying off today's combined trillion-dollar unfunded liabilities.

This affects different generations differently. One could argue that baby boomers' pension and COLA benefits are now actually running at a lower rate of increase than the actuaries had once assumed. (The problem with boomers is not their COLAs; it's their heretofore-underfunded benefits.) Conversely, the cost of COLAs for younger workers could break the bank in future decades if monetary inflation resurfaces. Worse, the 2030s and '40s markets could mirror the 1970s, crushing pension fund portfolios.

In the private sector, purchasers of retirement annuities have a choice: They can buy standard policies that pay a non-escalating benefit, or they can pay more to secure future inflation adjustments. Many public pensions, on the other hand, have installed caps on their COLAs to avoid runaway costs, but these caps have a perverse way of being lifted when elderly and disabled retirees swarm televised public hearings. One worthwhile reform would be to give non-vested younger employees and new hires a plan option to secure supplemental pension inflation protection at their own expense through a higher corresponding employee-contribution rate. This better aligns costs with benefits, and also inhibits unfunded increases.

A few states link COLA caps to the plans' funding progress. This squarely addresses the issue of future investment shortfalls: They are shared by all parties, not just employers. It's a logical concept but very difficult to implement, given the entrenched interests in pension politics.

This is an uncomfortable discussion, and probably an unwelcome topic in many circles. But the problem is real. Like the coronavirus, it will not fade away just because folks choose to deny, dismiss or ignore it.

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